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Leveraging AI to Automatically Link Controlled Vocabulary Terms in Metadata

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Automatically linking controlled vocabulary terms in metadata enhances semantic consistency and improves data interoperability across systems—particularly by connecting terms from frameworks such as OntoPortal, Skosmos, Wikidata, and others. This work presents an AI-driven approach that leverages Large Language Models (LLMs) in combination with knowledge graph techniques to identify and establish meaningful connections between controlled vocabulary terms. By harnessing the contextual understanding of LLMs and the structural capabilities of knowledge graphs, this method enables the automated enrichment and alignment of metadata vocabularies. The approach reduces manual curation efforts, supports scalable metadata harmonization, and opens new possibilities for intelligent data integration across domains.

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